ARB's Oil & Natural Gas Methane Regulation

Public Workshop

California Air Resources Board
Sacramento, California

December 9, 2014

Agenda

- Background
- Program Goals
- Source Category Proposals
- Environmental Analysis (EA)
- Standardized Regulatory Impact Assessment (SRIA)
- Feedback
- Next Steps

Background
and
Program Goals

Background

- **ARB Methane Regulation for Crude Oil and Natural Gas Production, Processing, and Storage.**
  - Includes Natural Gas Underground Storage and Transmission Compressor Stations
  - Encompasses well stimulation
- **Standards would apply to new and existing oil and natural gas facilities and equipment**

Background

- **ARB working with Air Districts to develop control strategies and craft ways to implement and enforce the new controls.**

- **ARB is working with the Division of Oil, Gas, and Geothermal Resources (DOGGR) on well stimulation issues**
  - MOA between the districts, ARB, and DOGGR being finalized and will be available soon

Program Goals

- To obtain the maximum methane emission reductions possible from the oil and gas production, processing, storage, and transmission compressor sectors, in a technically feasible and cost-effective manner.
- To promote statewide uniformity of methane emission controls by promulgating a statewide regulation.

Program Goals

- To minimize the administrative burden on the local air districts by promulgating a statewide regulation.
- To harmonize state requirements with current local and federal requirements to the extent feasible.

Program Goals

- To achieve co-benefits that protect public health from toxic emissions from well stimulation or other sector sources.
- To support the State Implementation Plan we administer by designing a regulation that attends to criteria pollutant goals.

Soliciting Feedback

- Source Category Proposals
- Environmental Assessment
- Standardized Regulatory Impact Assessment

Source Category Proposals

Source Category Proposals

- **ARB is developing methane emission controls for the following source categories:**
  - Separator and Tank Systems
  - Reciprocating and Centrifugal Compressors
  - Reduced Emission Completions for Oil & Gas Wells
  - Pneumatic Devices and Pumps
  - Liquids Unloading for Gas Wells
  - Methane Leak Detection and Repair

Source Category Proposals

- Following emission estimates estimated using Second Assessment Report GWP.
- Will be revising to Fourth Assessment Report GWP.
- Cost estimates do not include offsetting captured gas benefits.
- Continuing to evaluate emissions and costs.

Source Category Proposals

- **Current emission estimates based on:**
  - 2009 ARB Oil & Gas Industry Survey
  - ARB collected field test data
  - US EPA white papers (April 2014)
- **Current cost estimates based on:**
  - ICF Economic Analysis (March 2014)
  - US EPA Natural Gas Star Program
- **Examining other sources, including US EPA, ARB's MRR, EDF studies, etc.**

Separator & Tank Systems: Proposal

- Representative flash test required for systems without a vapor collection system.
  - **Representative oil and water samples required**
- Systems above methane standard required to have vapor collection on primary and secondary vessels.
  - **Methane Standard TBD**
- ARB continuing to evaluate wastewater discharge requirements.

Separator & Tank Systems: Proposal

- Estimated emissions and costs:
  - 200,000-1M MTCO2e statewide (uncontrolled)
  - $35,000-$100,000 per two tank system
  - $1,000 per flash test
- Requesting feedback to refine the proposal:
  - **Alternative control methods**
  - **Number of affected separators/tanks**
  - **Testing requirements and standards**
  - **Costs and emissions and reduction estimates**

Reciprocating Compressors: Proposal

- Rod Packing replacement for Oil & Gas Production ***and*** Natural Gas Storage & Transmission sectors.
- Proposed requirements similar to US EPA NSPS OOOO:
  - **Change seals every 36 months w/o monitoring; or**
  - **Change seals every 26,000 hours of operation with monitoring hours of operation; or**
  - **Route vent gas to vapor collection system.**
  - **Seeking feedback on other alternatives, such as direct measurement and replacement program.**

Reciprocating Compressors: Proposal

- Estimated emissions and costs:
  - 400,000 MTCO2e statewide (uncontrolled)
  - $500-$6,000 per rod packing change out
- Requesting feedback to refine the proposal:
  - **Alternative control methods**
  - **Number of affected compressors by horsepower range**
  - **Costs of replacement by horsepower range**
  - **Emissions and reduction estimates**

Centrifugal Compressors: Proposal

- Requirements for Oil & Gas Production ***and*** Natural Gas Storage & Transmission sector compressors.
- Proposed requirements similar to US EPA NSPS OOOO:
  - **Replace wet seals with dry seals; or,**
  - **Route vent gas to gas collection system.**
  - **Route starter gas to gas collection system.**

Centrifugal Compressors: Proposal

- Estimated emissions and costs:
  - 20,000 MTCO2e statewide (uncontrolled)
  - $30,000 - $50,000 cost range
- Requesting feedback to refine the proposal:
  - **Alternative control methods**
  - **Estimated costs by horsepower range**
  - **Feasibility**
  - **Emissions and reduction estimates**

Reduced Emission Completions (RECs) for Oil and Gas Wells: Proposal

- US EPA NSPS OOOO requires RECs for hydraulically fractured natural gas wells and is currently evaluating RECs for oil wells.
- Gas vapors are collected during the well completion process and routed to a sales line or combusted.
- Investigating well stimulation recirculation tanks.

Reduced Emission Completions (RECs) for Oil and Gas Wells: Proposal

- Estimated emissions and costs:
  - 5,000 MTCO2e statewide (uncontrolled)
  - $30,000 cost estimate
- Requesting feedback to refine the proposal:
  - **Alternative control methods**
  - **Number of affected sources**
  - **Costs to modify or retrofit systems**
  - **Emissions and reduction estimates from different completions**

Gas Powered Pneumatic Devices: Proposal

- Gas powered valves and actuators required to meet low-bleed rate standard:
  - **Standard 6 standard cubic feet per hour**
  - **Considering intermittent and zero bleed rate equivalent standards**
- Gas powered pneumatic pumps required to meet zero leak rate standard:
  - **Solar powered; or**
  - **Electric powered; or**
  - **Air powered.**

Gas Powered Pneumatic Devices: Proposal

- Estimated emissions and costs:
  - 150,000 MTCO2e statewide (uncontrolled)
  - $3,000 - $10,000 cost range
- Requesting feedback to refine the proposals:
  - **Alternative control methods**
  - **Updated component inventories**
  - **Costs to retrofit or replace devices**
  - **Emissions and reduction estimates**

Liquids Unloading from Gas Wells: Proposal

- In mature gas wells, liquids can accumulate at the bottom of the well and obstruct gas flow.
- Liquids can be unloaded by venting, with use of soap solutions, or by installing devices.
- Proposed requirements for gas wells:
  - **Plunger Lift System or,**
  - **Velocity Tubing or,**
  - **Artificial Lift System or,**
  - **Soap-solution system.**

Liquids Unloading from Gas Wells: Proposal

- Estimated emissions and costs:
  - <1,000 MTCO2e statewide (uncontrolled)
  - $20,000 for Plunger Lift System
- Seeking feedback to refine the proposal:
  - **Alternative control methods**
  - **Number of affected gas wells**
  - **Feasibility of installing equipment**
  - **Cost estimates**
  - **Emissions and reduction estimates**

Methane Leak Detection and Repair (LDAR): Proposal

- Integrate methane components into existing air district inspection programs for VOCs:
  - Inspection frequency to remain unchanged
  - Standards to remain unchanged
  - Possible option for districts to allow other instruments
- New LDAR requirement for facilities and air districts without existing inspection programs:
  - **Leak Detection Standard 1,000 ppm methane**
  - **Annual Inspection Frequency**

Methane Leak Detection and Repair (LDAR): Proposal

- Estimated emissions and costs:
  - 7,000 MTCO2e statewide (uncontrolled)
  - $170,000 staff plus equipment
- Seeking feedback to refine the proposal:
  - **Alternative approaches, e.g., a focus on screening for and repairing large leaks**
  - **Standards and inspection frequency**
  - **Cost estimates**
  - **Emissions and reduction estimates**

Environmental Analysis

and

Standardized Regulatory Impact Assessment

Environmental Analysis

- **An Environmental Analysis (EA) is prepared for proposed actions that may result in significant adverse impacts to the environment.**
  - Prepared according to the requirements of ARB's certified regulatory program under the California Environmental Quality Act (CEQA)

- **EA will Include:**
  - Methods of Compliance
  - Beneficial Impacts & Adverse Impacts
    - *Direct, Indirect, & Cumulative*
  - Mitigation Measures & Alternatives Analysis

Environmental Analysis

- **Beneficial Impacts:**
  - Reduced GHG emissions
  - Reduced VOC and TAC emissions

- **Potentially adverse impacts:**
  - Potential NOx emission impacts
  - Potential ground disturbance

Environmental Analysis

- ARB is requesting feedback on the appropriate scope and content of the draft EA as it's being developed, which includes:
  - **Compliance Methods**
  - **Potential for Significant Adverse Impacts**
  - **Mitigation Measures and Alternatives**
- There will be an additional opportunity to comment on the draft EA during the 45-day comment period. The draft EA will be an Appendix to the Staff Report, to be released with the Proposed Regulation.

Standardized Regulatory Impact Assessment

- Senate Bill 617 established a requirement for a **Standardized Regulatory Impact Assessment (SRIA)** when a State agency estimates a regulation has an economic impact to the California economy exceeding $50 million
- Includes direct and indirect costs or benefits
- The threshold applies to costs and benefits separately
- This regulation may or may not exceed the threshold after full analysis

Standardized Regulatory Impact Assessment

- Must be completed and submitted to the Department of Finance 120 days before the Board Hearing
  - **Department of Finance** required to review the SRIA and provide comments to the State agency.
- **Requesting information to complete the SRIA:**
  - Alternative strategies that achieve program goals at a lower cost
  - Estimates of costs and benefits of alternative strategies

Feedback
and
Next Steps

Feedback

- **Feedback by January 9, 2015.**
- **Program contacts:**
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  - –Environmental Analysis, Johanna Levine
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Next Steps

- **Receive stakeholder feedback:**
  - Source Category Proposals
  - Environmental Analysis
  - Standardized Regulatory Impact Analysis
- **SRIA due to DOF Feb 20, 2015**
  - DOF will post online within 10 days
- **Next workshop early 2015:**
  - Draft regulation language
  - Updated cost and emissions and reduction estimates

Next Steps

- **Public Notice out May 6, 2015:**
  - Staff Report
  - Regulatory language as an appendix
  - EA as an appendix
- **Board Meeting June 25, 2015**
- **Second Board Meeting late 2015:**
  - Addresses EA comments

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